CLAIMS

I claim:

1. A method for making a flexible polyurethane foam, comprising:

mixing at a mix head to react (i) a polyether graft polyol or an ester polyol having a number average molecular weight of from about 500 to about 8000, or a mixture thereof, with (ii) an isocyanate selected from the group consisting of diphenylmethane 4, 4' diisocyanate, diphenyl methane 2, 2' diisocyanate, diphenylmethane 2, 4' diisocyanate, toluene diisocyanate, higher molecular weight isocyanate oligomers, and mixtures thereof, with an isocyanate index in the range of 95 to 110 to form a reaction mix;

incorporating into the reaction mix water in an amount from 0.2 to 1.0 parts by weight per hundred parts polyol;

further incorporating into the reaction mix one or more anti-static additives in an amount from 0.1 to 20 parts by weight per hundred parts polyol, to form a foam-forming mixture; and

presenting the foam-forming mixture to an open container or a moving conveyor to permit free rise expansion of the polyurethane foam;

wherein, upon curing, the polyurethane foam has a density in the range of 6 to 20 pounds per cubic foot, a surface resistivity below 1×10^{11} ohms/square, and a pore size in the range of 100 to 250 pores per inch.

2. The method of claim 1, wherein the anti-static additive is selected from the group consisting of: quarternary ammonium compounds, metallic salts, complexes of metallic salts with polyhydric alcohols and their derivatives, complexes of metallic salts with mono-ols,

hexahalogenated ionic compounds, and carbon black

3. The method of claim 1, further comprising incorporating into the reaction mix at the mix head one or more polyether polyols in addition to the graft polyol or ester polyol.

4. The method of claim 3, wherein the graft polyol comprises at least 20 parts by weight per hundred parts of the polyol component of the reaction mix.

5. The method of claim 1, further comprising incorporating into the reaction mix at the mix head a cross-linking agent selected from the group consisting of diethanolamine (DEOA), ethylene glycol (EG), diethylene glycol (DEG), triethylene glycol (TEG), propylene glycol (PG), dipropylene glycol (DPG), 1,4 butanediol (BDO), and mixtures thereof, and in an amount from 0 to 25 parts by weight per hundred parts polyol.

6. The method of claim 1, wherein the surface resistivity of the polyurethane foam is from 1 x 10^7 ohms/square to 1 x 10^9 ohms/square.

7. The method of claim 1, wherein the density of the polyurethane foam is from 7 to 9 pounds per cubic foot.

8. The method of claim 1, wherein the isocyanate is diphenylmethane 4, 4' diisocyanate or diphenylmethane 2, 2' diisocyanate or diphenylmethane 2, 4' diisocyanate, or mixtures thereof.

9. A method for making a shaped polyurethane foam part, comprising:

mixing at a mix head to react (i) a polyether graft polyol or an ester polyol having a number average molecular weight of from about 500 to about 8000, or a mixture thereof, with (ii) an isocyanate selected from the group consisting of diphenyl 4, 4' diisocyanate, diphenylmethane 2, 2' diisocyanate, diphenylmethane 2, 4' diisocyanate, toluene diisocyanate, higher molecular weight isocyanate oligomers, and mixtures

thereof, to form a reaction mix;

incorporating into the reaction mix water in an amount from 0.2 to 1.0 parts by weight per hundred parts polyol;

further incorporating into the reaction mix one or more anti-static additives in an amount from 0.1 to 20 parts by weight per hundred parts polyol, to form a foam-forming mixture;

presenting the foam-forming mixture to an open container or a moving conveyor to permit free rise expansion of the polyurethane foam, wherein, upon curing, the polyurethane foam has a density in the range of 6 to 20 pounds per cubic foot, a surface resistivity below 1 x 10^{11} ohms/square, and a pore size in the range of 100 to 250 pores per inch.; and

fabricating the polyurethane foam into the shaped polyurethane foam part.

10. The method of claim 9, wherein the anti-static additive is selected from the group consisting of: quarternary ammonium compounds, metallic salts, complexes of metallic salts with polyhydric alcohols and their derivatives, complexes of metallic salts with mono-ols, hexahalogenated ionic compounds, and carbon black.

11. The method of claim 9, further comprising incorporating into the reaction mix one or more polyether polyols in addition to the graft polyol or ester polyol.

12. The method of claim 11, wherein the graft polyol comprises at least 20 parts by weight per hundred parts of the polyol component of the reaction mix.

13. The method of claim 9, further comprising incorporating into the reaction mix a cross-linking agent selected from the group consisting of: diethanolamine (DEOA), ethylene glycol

(EG), diethylene glycol (DEG), triethylene glycol (TEG), propylene glycol (PG), dipropylene glycol (DPG), 1,4 butanediol (BDO), and mixtures thereof, and in an amount from 0 to 25 parts by weight per hundred parts polyol.

14. The method of claim 9, wherein the surface resistivity of the polyurethane foam is from 1 x 10^7 ohms/square to 1 x 10^9 ohms/square.

15. The method of claim 9, wherein the density of the polyurethane foam is from 7 to 9 pounds per cubic foot.

16. The method of claim 9, wherein the isocyanate is diphenylmethane 4, 4' diisocyanate or diphenylmethane 2,2' diisocyanate or diphenylmethane 2, 4' diisocyanate, or mixtures thereof.

17. The method of claim 9, wherein fabricating comprises one or more of grinding, slicing, die-cutting, machining, peeling, convoluting, laser cutting, water pressure cutting or otherwise shaping by cutting.

18. A polyurethane foam produced by the method of claim 1.

19. A polyurethane foam part produced by the method of claim 9.